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June 14, 2000

VIA HAND DELIVERY

Ms. Magalie Roman Salas
Federal Communications Commission
445 Twelfth Street, S.W.
TW-A325
Washington DC 20554

Re: RM-9864
Reply Comments of Spacenet Inc.

Dear Ms. Salas:

On behalf of Spacenet Inc. ("Spacenet"), I have enclosed the original and four copies of Spacenet's Reply Comments in Proceeding No. RM-9864. I have also enclosed an additional copy to be date-stamped and returned to our agent.

If you have any questions concerning this submission, please contact me.

Sincerely,

Richard M. Firestone

encl: original and four copies of the the Reply Comments of Spacenet Inc.
one copy of the Reply Comments to be date-stamped and returned

cc: International Transcription Services
Ms. Kathleen Campbell
Mr. Ronald Repasi
Mr. Hsing Liu
Mr. Mark P. Bresnahan
Mr. Michael M. Taylor

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Before the
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
Petition of Spacenet Inc. For a Declaratory Ruling that Section 25.134 of the Commission's Rules Permit VSAT Remote Stations in the Fixed Satellite Service to Use Network Access Schemes that Allow Statistically Infrequent Overlapping Transmissions of Short Duration; or, In the Alternative, For Rule Making to Amend That Section	)	RM-9864

To: The Commission

REPLY COMMENTS OF SPACENET INC.

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Reply Comments of Spacenet Inc.

Spacenet Inc. ("Spacenet") hereby submits its reply to the formal comments of PanAmSat Corporation ("PanAmSat") and Hughes Network Systems ("HNS"), and the e-mail comments of ALOHA Networks ("ALOHA Networks"), in the above-captioned proceeding. For the reasons set forth below, Spacenet urges the Commission to resolve this matter through a declaratory ruling rather than a rule making proceeding. Except for ALOHA Networks, the Commentors are supportive of Spacenet's position and, if anything, propose that VSAT system operators be given greater flexibility in designing their access systems than Spacenet suggested. The comments of ALOHA Networks are unpersuasive and are not supported by any evidence that its proposed standard is necessary to protect other users.

The Positions of the Commentors

A. PanAmSat

PanAmSat, a leading space station provider and, therefore, one of the parties who would be directly affected if network access schemes of the type discussed in the Petition were to cause harmful interference, supports Spacenet's Petition and urges the Commission to grant it without delay. PanAmSat further urges the Commission, in a future proceeding, to "update and refine" its VSAT rules in recognition of the industry's long experience that "the power level limits in the rules now are more restrictive than they need to be, or should be," particularly in light of the technological advances of the last decade.[1]

B. HNS

HNS, a leading provider of VSAT networks, argues that VSAT access schemes of the

[1] Comments of PanAmSat at 2, 3.

sort discussed in the Petition, which are widely used by VSAT providers, do not violate the terms of Section 25.134 of the Commission's rules as that Section is currently written. HNS therefore questions the need for any Commission action. HNS urges the Commission, if it nevertheless perceives a need to act, to issue a declaratory ruling incorporating the first and third clauses of Spacenet's proposed ruling, which deal with the antenna power density limit of each station individually and the maximum duration of individual overlapping transmissions.

HNS would replace Spacenet's proposed second clause, which limits the statistical frequency of collisions, with a more expansive clause limiting the total average power radiated toward the target satellite by all of the remote stations in the network to a value equal to the allowable power of a single station transmitting continuously, using an averaging period of one second.[2]

C. ALOHA Networks

ALOHA Networks, a company seeking to market its own access scheme, claims that the collision probabilities for slotted Aloha systems, which comprise the majority of installed VSAT networks, are governed by the binomial model rather than by the Poisson model, and that the binomial model predicts more interference than the Poisson model. ALOHA Networks notes that, as Spacenet detailed in the Petition, a slotted Aloha network may have collision rates of 0.5% at peak loading, and that "[i]f this level of interference were acceptable, it would follow that the interference limits of Section 25.134 are unnecessarily restrictive."[3] Finally, ALOHA Networks argues that the second clause of Spacenet's

[2] See Comments of HNS at 4–5.

[3] E-mail Comments of ALOHA Networks.

proposed declaratory ruling "applies only to the case of slotted ALOHA" and that similar rulings would be necessary for other access schemes, such as unslotted Aloha and ALOHA Networks's proprietary spread Aloha implementation.

ALOHA Networks urges the Commission to accept the first and third clauses of Spacenet's proposed ruling, and proposes a different second clause limiting the collision rate at peak loading to less than one second per hour (i.e., less than 0.028%).

Spacenet's Reply

A. Reply to the Formal Comments of HNS and PanAmSat

Both HNS and PanAmSat support Spacenet's request for clarification that access protocols of the sort discussed in the Petition do not violate Section 25.134 of the rules. Indeed, both urge the Commission to adopt a more relaxed standard than the one proposed in the Petition. It may well be that the limit specified in the Petition is itself unnecessarily stringent, particularly in light of the technological improvements alluded to by PanAmSat.[4] Spacenet is not opposed to a declaratory ruling or rulemaking that sets more relaxed standards than those specified in the Petition,[5] and would welcome the opportunity to comment on such a proposal if the Commission were to consider it in a future proceeding.

However, as PanAmSat notes, such an inquiry "should not delay action on Spacenet's Petition."[6] As HNS points out, regulatory certainty and the availability of routine processing of applications are very important to a competitive and rapidly evolving market such as the VSAT industry.[7] Even the possibility that the FCC might interpret Section 25.134 to prohibit

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[4] See Comments of PanAmSat at 2; see also Comments of HNS at 4.

[5] See Petition at 4 n.5.

[6] Comments of PanAmSat at 3.

[7] See Comments of HNS at 2.

all simultaneous remote-station transmissions regardless of duration and statistical frequency is a significant threat, and disrupts the regulatory certainty, previously enjoyed by the VSAT industry, that has helped foster its continuing rapid growth. Restoring that certainty requires immediate action.

The declaratory ruling that the Petition seeks is the best means to address the limited issue that is before the Commission at this time. It would immediately protect the status quo — the longstanding industry practice that is known not to cause harmful interference — and thereby restore the regulatory certainty that has made the VSAT industry the vibrant and competitive market that it is today. It would leave for a future proceeding the larger questions of whether a relaxation of the standard is appropriate and what other rule changes should be made — questions that will benefit from further exploration in another proceeding.

B. Reply to the E-mail Comments of ALOHA Networks

The objections raised by ALOHA Networks miss the point. The Petition simply asks the Commission to declare that a longstanding and widespread industry practice, one that causes no harmful interference and through which both the satellite and VSAT industries operate effectively to provide a wide variety of services to the public, comports with its rules.

The Petition calculates the probability of collisions in typical systems operated at peak load, but the justification for the specified rate is not theoretical or mathematical. The best justification for declaring that these access schemes comply with the rules is the industry's experience, over more than fifteen years, that systems operating as the Petition describes do not cause harmful interference. This is shown by Spacenet's own experience,[8] by the

[8] See Petition at 3, 8.

experience of HNS,[9] by the absence of opposition to the Petition from any space station licensees, who would be the ones impacted directly by any interference, and by the support of PanAmSat, a leading space station provider, based on its experience that these schemes do not cause harmful interference.[10]

While the binomial model describes the collision probabilities in a slotted Aloha system more accurately than the Poisson model, ALOHA Networks is incorrect that the Poisson model underestimates the probability of collisions by a factor of three. In fact, the simpler Poisson approximation *overestimates* the probability of collisions by a small amount. In a system operating at maximum practical loading, the Poisson model predicts an approximately 0.6% greater probability of collisions than the binomial model for small networks (for five transmitters, 5.05% Poisson vs. 4.42% binomial). The models converge as the number of transmitters increases and as loading is reduced. For networks with more than fifty transmitters, the models are within 0.1% at any practical loading.

Against the weight of the entire industry's experience over 15 years, ALOHA Networks does not present any evidence that the status quo is harmful, or that a collision rate lower than 0.028% is necessary to protect other users. The fact that the most common industry practice for over fifteen years is not only "acceptable," but is affirmatively advocated by PanAmSat, who would be directly affected by any interference, clearly indicates how the Commission should treat ALOHA Networks's statement that "[i]f this level of interference were acceptable, it would follow that the interference limits of Section 25.134 are

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[9] See Comments of HNS at 2.

[10] See Comments of PanAmSat at 1 and passim.

unnecessarily restrictive."[11] The correct response is not to impose more restrictive standards on access schemes, but to acknowledge explicitly that they do not cause harmful interference.[12]

Indeed, adopting ALOHA Networks's proposed rule would effectively eliminate the entire installed base of existing VSAT systems — and do so for no real-world reason. A collision rate of less than 0.028% requires a slotted Aloha network to operate at a loading (G, the average number of transmissions per slot) of less than 2.38%, with a throughput (the number of slots occupied by exactly one transmission) of less than 2.32%. Such a low traffic level would render slotted Aloha systems commercially nonviable. There is simply no evidence that such low collision rates are necessary to protect other users and warrant the disruption of existing services that this would entail.[13]

Finally, with respect to ALOHA Networks's third argument, Spacenet's proposed ruling is derived from experience with slotted Aloha protocols. This is merely a recognition of historical reality and of the large numbers of slotted Aloha VSAT systems that have been operating throughout the United States for many years with no evidence of harmful interference. Spacenet could also be satisfied with a different standard, but only one that explicitly protects the status quo, such as the alternative proposed by HNS.

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[11] E-mail Comments of ALOHA Networks.

[12] See Comments of PanAmSat at 2 (citing improvements in technology since the Section was implemented); Comments of HNS at 4 (advocating an average-power standard).

[13] While proponents of systems claiming lower collision rates, such as ALOHA Networks with its proprietary spread Aloha implementation, might be competitively advantaged by a tighter rule, experience shows that such a rule is unnecessary to protect other users, which is the object of Section 25.134.

Conclusion

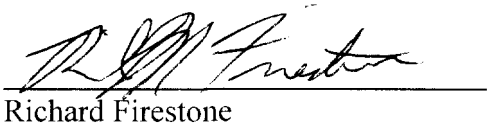
There is a clear recognition, including the evidence presented in the Comments of PanAmSat and HNS, that VSAT remote stations using network access protocols of the type discussed in the Petition do not cause harmful interference. Absolutely no evidence has been presented that such stations cause harmful interference or that a more stringent limit is necessary to protect other users. The Petition simply seeks a declaratory ruling that simultaneous VSAT remote-station transmissions do not violate Section 25.134 of the Commission's rules as long as the simultaneous transmissions are not of greater duration nor statistically more frequent than those that the industry knows, based on over fifteen years of experience, do not cause harmful interference.[14]

Spacenet does not object to a future proceeding in which other aspects of the VSAT rules, including whether the declaratory ruling proposed in the Petition is itself more stringent than necessary, are considered. However, in light of the uncertainty created by the possibility that the Commission might interpret Section 25.134 to prohibit simultaneous VSAT remote station transmissions regardless of their duration or statistical frequency, and considering that essentially all VSAT networks use access protocols that require such simultaneous transmissions, Spacenet believes that it is essential for the Commission to declare without delay that systems employing such protocols comply with Section 25.134 of the rules.

[14] Assuming, of course, that each station individually meets the requirements of Section 25.134.

Spacenet's request for a declaratory ruling should be granted, or in the alternative, the Commission should institute an expedited rule making proceeding to clarify that the existing practice of the VSAT industry comports with Section 25.134 of the rules.

Respectfully submitted,



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Dated: June 14, 2000